

### LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

- 1.(original) A polynucleotide comprising:
  - (a) a region which comprises as operably linked components (i) a promoter which provides for seed preferred expression; and (ii) a nucleotide sequence derived from a bacterium which sequence encodes a carotene desaturase; and (iii) a transcription termination region; and
  - (b) a further region which comprises as operably linked components (i) a promoter which provides for seed preferred expression; and (ii) a nucleotide sequence encoding a phytoene synthase which sequence is derived from maize (*Zea sp.*) or rice (*Orzya sp.*); and (iii) a transcription termination region.
- 2.(original) A polynucleotide according to claim 1 wherein the sequence which encodes the carotene desaturase is derived from *Erwinia sp.*
- 3.(currently amended) [[A]]The polynucleotide according to claim 1 ~~or claim 2~~ wherein said promoter is selected from the Glutelin 1 promoter and the Prolamin promoter and said transcription termination region is selected from the group consisting of Nos[;], CaMV 35S and PotP1-II transcription termination regions.
- 4.(currently amended) [[A]]The polynucleotide according to ~~any one of claims 1 to 3~~claim 1 wherein the sequence which encodes carotene desaturase and the sequence which encodes phytoene synthase further comprises a sequence encoding a plastid targeting sequence.
- 5.(currently amended) [[A]]The polynucleotide according to ~~any one of claims 1 to 4~~claim 1 wherein said region and/or said further region further comprises an intron.

6.(currently amended)      ~~[[A]]The polynucleotide according to any one of claims 1 to 5~~claim 1 which comprises a sequence selected from the group ~~depicted as SEQ ID NO: 1; 2; 3; 4; and 6~~consisting of SEQ ID NO: 1, 2, 3, 4, 5, and 6.

7.(currently amended)      A polynucleotide sequence which is the complement of one which hybridises to ~~[[a]]the~~ polynucleotide according to claim 6 at a temperature of about 65°C in a solution containing 6 x SSC, 0.01% SDS and 0.25% skimmed milk powder, followed by rinsing at the same temperature in a solution containing 0.2 x SSC and 0.1% SDS wherein said polynucleotide sequence still comprises a region encoding a carotene desaturase and a further region encoding a phytoene synthase and when said polynucleotide sequence is inserted into plant material the seed of a plant regenerated from said material produce an increased amount of carotenoids when compared to a control like-seed.

8.(currently amended)      ~~[[A]]The~~ polynucleotide sequence according to claim 7 wherein when said polynucleotide sequence is inserted into plant material, the seed of a plant regenerated from said material produces at least a sixty fold increase in carotenoids when compared to a control like-seed.

9.(currently amended)      ~~[[A]]The~~ polynucleotide sequence according to claim 7 wherein when said polynucleotide sequence is inserted into plant material, the seed of a plant regenerated from said material produces at least a three hundred and fifty fold increase in carotenoids when compared to a control like-seed.

10.(currently amended)      ~~[[A]]The~~ polynucleotide sequence according to claim 7 wherein when said polynucleotide sequence is inserted into plant material the seed of a plant regenerated from said material produces carotenoids at a level of at least 10µg/g of endosperm of said seed.

11.(currently amended)      ~~[[A]]The~~ polynucleotide sequence according to claim 7 wherein when said polynucleotide sequence is inserted into plant material the

seed of a plant regenerated from said material produces carotenoids at a level of at least 15µg/g of endosperm of said seed.

12.(currently amended) A polynucleotide sequence which is the complement of one which hybridises to ~~[[a]]~~the polynucleotide according to claim 6 at a temperature of about 65°C in a solution containing 6 x SSC, 0.01% SDS and 0.25% skimmed milk powder, followed by rinsing at the same temperature in a solution containing 0.2 x SSC and 0.1% SDS wherein said polynucleotide sequence still comprises a region encoding a carotene desaturase and a further region encoding a phytoene synthase and when said polynucleotide sequence is inserted into plant material the seed of a plant regenerated from said material produce carotenoids amounting to at least 80% of the carotenoid content of a seed which comprises a polynucleotide selected from the group ~~depicted as SEQ ID NO: 1; 2; 3; 4; 5 and 6~~consisting of SEQ ID NO: 1, 2, 3, 4, 5 and 6.

13.(currently amended) ~~[[A]]~~The polynucleotide sequence according to claim 12 wherein when said polynucleotide sequence is inserted into plant material the seed of a plant regenerated from said material produces carotenoids amounting to at least 100% of the carotenoid content of a seed which comprises a polynucleotide selected from the group ~~depicted as SEQ ID NO: 1; 2; 3; 4; 5 and 6~~consisting of SEQ ID NO: 1, 2, 3, 4, 5 and 6.

14.(currently amended) ~~[[A]]~~The polynucleotide sequence according to ~~any one of claims 7 to 13~~claim 7 wherein said seed is a rice seed.

15.(currently amended) ~~[[A]]~~The polynucleotide ~~or a polynucleotide sequence~~ according to ~~any one of claims 1 to 14~~claim 1 which further comprises a region which encodes a selectable marker.

16.(currently amended) ~~[[A]]~~The polynucleotide ~~or a polynucleotide sequence~~ according to claim 15 wherein said selectable marker comprises a mannose-6-phosphate isomerase gene.

- 17.(currently amended)      ~~[[A]]The polynucleotide or a polynucleotide sequence~~  
according to ~~any one of claims 1 to 16~~claim 1 which is codon optimised for  
expression in a particular plant species.
- 18.(currently amended)      ~~[[A]]The polynucleotide or a polynucleotide sequence~~  
according to claim 17 wherein said plant species is rice (*Oryza sp.*).
- 19.(currently amended)      A vector comprising ~~[[a]]the polynucleotide or a~~  
~~polynucleotide sequence according to any one of claims 1 to 18~~claim 1.
- 20.(currently amended)      A method for increasing the carotenoid content of seeds  
comprising inserting into plant material a polynucleotide ~~or a polynucleotide~~  
~~sequence according to any one of claims 1 to 18~~claim 1 ~~or a vector according to~~  
~~claim 19~~; and regenerating a seed-containing plant from said material and  
identifying the seeds which contain carotenoids at levels greater than those of  
control like-seeds.
- 21.(currently amended)      A method for increasing the carotenoid content of a seed  
comprising inserting into plant material a polynucleotide comprising a sequence  
selected from the group ~~depicted as SEQ ID NO: 1; 2; 3; 4; 5 and 6~~consisting of  
SEQ ID NO: 1, 2, 3, 4, 5 and 6 and regenerating a seed-containing plant from  
said material and identifying the seed which contains carotenoids at levels greater  
than those of a control like-seed.
- 22.(currently amended)      ~~[[A]]The method according to claim 20 or claim 21~~  
wherein said seed contains at least a sixty fold increase in carotenoids when  
compared to a control like-seed.
- 23.(currently amended)      ~~[[A]]The method according to claim 22 wherein said seed~~  
contains at least a three hundred and fifty fold increase in carotenoids when  
compared to control like-seed.

- 24.(currently amended)      ~~[[A]]The method according to claim 20 or claim 21-~~  
wherein said seed contains carotenoids at a level of at least 10µg/g of endosperm  
of said seed.
- 25.(currently amended)      ~~[[A]]The method according to claim 24 wherein said seed~~  
contains carotenoids at a level of at least 15µg/g of endosperm of said seed.
- 26.(currently amended)      ~~[[A]]The method according to any one of claims 20 to~~  
~~25~~claim 20 wherein said carotenoids are selected from the group consisting of:  
lycopene[;], alpha-carotene[;], lutein[;], beta-carotene[;], zeaxanthin[;],  
antheraxanthin[;], violaxanthin[;], and neoxanthin; or a combination thereof.
- 27.(currently amended)      A seed obtained by ~~[[a]]the method according to any one~~  
~~of claims 20 to 26~~claim 20.
- 28.(currently amended)      ~~[[A]]The seed according to claim 27 which is a rice seed.~~
- 29.(currently amended)      A plant which comprises ~~[[a]]the seed according to claim~~  
~~27 or claim 28.~~
- 30.(currently amended)      A plant or plant material which comprises a polynucleotide  
~~or a polynucleotide sequence according to any one of claims 1 to 18 or a vector~~  
~~according to claim 19~~claim 1.
- 31.(currently amended)      ~~[[A]]The plant or plant material according to claim 30~~  
which is a rice plant or is rice plant material.
- 32.(currently amended)      ~~[[A]]The plant or plant material according to claim 30~~  
which is a maize plant or is maize plant material.
- 33.(currently amended)      ~~[[A]]The plant according to any one of claims 29 to~~  
~~32~~claim 29 which further comprises a polynulceotide which provides for a trait  
selected from the group consisting of: insect resistance and/or tolerance[;].

nematode resistance and/or tolerance[[:]], herbicide resistance and/or tolerance[[:]], improved resistance and/or tolerance to stress[[:]], a substance having pharmaceutical activity[[:]], and any other desired agronomic trait.

34.-37.(cancelled)